

ABSTRACT OF THE DISCLOSURE

A semiconductor device having a memory cell portion and a peripheral circuit portion is provided which achieves suppression of reduction of punch-through margin of transistors in the peripheral circuit portion and offers ensured short margin and enhanced current driving capability. After a high-temperature (800°C to 1000°C) thermal treatment that is performed to improve burying characteristics after formation of an interlayer insulating film, and also after a high-temperature (800°C to 1000°C) thermal treatment that is performed to enhance refresh characteristics after formation of contact plugs in the memory cell portion, a silicon oxide film and insulating film formed on a semiconductor substrate in the peripheral circuit portion are removed by anisotropic dry-etching, leaving the insulating film as sidewall insulating films on sides of sidewall nitride films. Then an impurity ion implantation process is performed using gate interconnections as implant masks to form source/drain regions in the peripheral circuit portion.